

1. INTRODUCTION

In accordance with the Energy Reorganization Act of 1974 (42 U.S.C. 5801), the U.S. Department of Energy (DOE) established the Solar Energy Research Institute (SERI) in 1977. SERI was designated as a national laboratory and became the NREL in 1991. The National Renewable Energy Laboratory (NREL) was established to support DOE's mission to research and develop energy efficiency and renewable energy technologies. Among other responsibilities, NREL oversees the NWTC located in Jefferson County, Colorado. The NWTC is a federally owned, contractor-operated site.

In accordance with the DOE NEPA regulations, DOE is required to evaluate the existing Site-Wide EA every five years to determine whether the Site-Wide EA adequately addresses current agency plans, functions, programs and resource utilization. A Site-Wide EA for the NWTC was published in 1996 (DOE-EA-1127). DOE has determined that a new comprehensive EA should be prepared for the site to address new site development proposals and changes in the regional environment.

In compliance with the NEPA (42 U.S.C. 4321) and DOE's NEPA implementing regulations (10 CFR section 1021.330), this Site-Wide EA examines the potential environmental impacts of site operations, a short-term and long-term program of improvements at the NWTC, and a No Action alternative.

DOE is the lead agency for this EA, and other federal, state, and local agencies and the public have been invited to participate in the environmental documentation process.

1.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to support DOE's mission in the research and development of energy efficiency and renewable energy technologies. DOE's Office of Energy Efficiency and Renewable Energy (EERE) leads the national research effort to develop clean, competitive, and reliable renewable energy and power delivery technologies for the 21st century. The program supports research and development of clean, reliable renewable energy technologies. The goal of the program is to improve the Nation's overall economic strength and competitiveness, energy security, and environmental health through the development of clean, competitive, and reliable power technologies.

Alternative energy technology research is needed to improve technical designs, improve power generation efficiencies, increase economic competitiveness, and fully characterize and minimize environmental impacts from various technologies. The EERE research and development program focus areas include, but are not limited to, bioenergy, wind, hydrogen, hydropower, geothermal, and solar energy technologies. NWTC is EERE's and the Nation's principal research site for wind power and distributed energy resources.

The mission of EERE's Wind Energy Program is to help the United States attain the substantial economic, environmental and energy security benefits likely to result from expanding the domestic and worldwide use of wind energy by fostering a world-class, domestic wind industry. The program focuses on research, testing and field verification work needed by U.S. industry to fully develop advanced wind energy technologies, and on coordination with partners and

stakeholders to overcome barriers to wind energy implementation. EERE's principal research vehicle to accomplish this goal is the NWTC.

NREL's Distributed Energy Resources (DER) Center and Distributed Power Program supports the development of technologies and policies that enable distributed generation (e.g., photovoltaic, wind, fuel cells, and microturbines), storage, and direct load control technologies to be integrated into the electric system. Through a collaboration of the national laboratories and industry partners, DOE's Distributed Power Program is pursuing activities in the following three areas: 1) strategic research, 2) system integration, and 3) mitigation of regulatory and institutional barriers.

Distributed power is modular electric generation or storage located near the point of use. Distributed systems include biomass-based generators, combustion turbines, concentrating solar power and photovoltaic systems, fuel cells, wind turbines, microturbines, engines/generator sets, and storage and control technologies. Distributed resources can either be grid-connected or operate independently of the grid. Those connected to the grid are typically interfaced at the distribution system. In contrast to large, central-station power plants, distributed power systems typically range from less than a kilowatt (kW) to tens of megawatts (MW) in size.

A prime and unique function of NWTC is its interaction with and use by the American wind industry clients/partners in the Industrial User Facility and other test sites. As a part of the fulfillment of the Wind Program's mission to promote and facilitate commercialization of wind energy technologies, joint projects are conducted with various industrial partners and groups.

The Proposed Action would provide and maintain enhanced facilities and infrastructure that would adequately support the site purpose of state-of-the-art alternative energy research. Specific purposes and needs for key improvements are summarized as follows:

- New or enhanced Structural Blade Testing Facility, Dynamometer Test Facility and test pad facilities are needed for research involving larger, state-of-the-art turbines (a dynamometer is an instrument used to measure mechanical power).
- New or enhanced hybrid power and independent power facilities that are designed for a full range of DER research are needed to allow testing of advanced technologies. These technologies include photovoltaic, wind, fuel cell, micro-turbine, concentrated solar power, storage, combined heat and power, modular biomass, and others.
- New or upgraded office facilities, utilities, security improvements, and other necessary infrastructure are needed to allow for greater flexibility and efficiency of research configurations, alternatives, and testing possibilities.

1.2 SITE DESCRIPTION

1.2.1 Site Background and History

The 305-acre NWTC is located in northwest Jefferson County, Colorado, approximately 16 miles northwest of Denver. The site is south of Highway 128 and directly east of aggregate mining and processing facilities on the east side of Highway 93 between Golden and Boulder, Colorado. The Boulder/Jefferson County line is the site's northern boundary line. A regional location map is presented in Figure 1-1. A local setting map is presented in Figure 1-2. A site map is presented in Figure 1-3.